03050202-070

(Charleston Harbor/Stono River)

General Description

Watershed 03050202-070 is located in Charleston County and consists primarily of the ***Charleston Harbor*** and its tributaries, and the ***Stono River*** with its tributaries from Wappoo Creek to the Atlantic Ocean. The watershed occupies 81,620 acres of the Coastal Zone region of South Carolina. The predominant soil types consist of an association of the Bohicket-Capers-Kiawah-Foxworth series. The erodibility of the soil (K) averages 0.20; the slope of the terrain averages 1%, with a range of 0-6%. Land use/land cover in the watershed includes: 26.5% nonforested wetland, 25.0% water, 23.8% forested land, 10.1% scrub/shrub land, 10.0% urban land, 3.2% agricultural land, 1.1% forested wetland, and 0.3% barren land.

This segment of the Stono River, classified SFH, accepts drainage from the upper Stono River watershed (03050202-050), flows between Johns Island and James Island, and then flows through the Stono Inlet to the Atlantic Ocean. On the Johns Island side of the river, the Stono River receives drainage from Pennys Creek, Hut Creek, Abbapoola Creek, Alligator Creek, and the Kiawah River. The Kiawah River accepts drainage from Captain Sams Creek, Haulover Creek, Bryans Creek, and Chaplin Creek. The Kiawah River drains directly into the Atlantic Ocean through Captain Sams Inlet. Bass Creek (Cinder Creek) drains into the Stono River from Kiawah Island.

Streams draining into the Stono River from James Island include James Island Creek or Ellis Creek (Simpson Creek, Wolfpit Run), Holland Island Creek, and Green Creek. The Folly River (Folly Creek, Oak Island Creek, Robbins Creek, King Flats Creek, Cutoff Reach, Cole Creek), classified SFH, drains into the Stono River at the mouth of the Stono River. Robbins Creek and King Flats Creek are also connected to the Stono River through Green Creek. Lighthouse Creek (Block Island Creek, Rat Island Creek, Ft. Johnson Creek, First Sister Creek, Second Sister Creek) flows between Folly Island and Morris Island and through Lighthouse Inlet to the ocean. Ft. Johnson Creek connects the Lighthouse Creek drainage to Clark Sound (Seaside Creek, Secessionville Creek). The sound drains into Charleston Harbor through Schooner Creek near Fort Sumter. Charleston Harbor is classified SB. The Ashley River watershed (03050202-040) draining into the harbor is classified SA and the Cooper River watershed (03050201-050) draining into the harbor is classified SB. Also draining in the Charleston Harbor is Dill Creek, Horse Creek, Shem Creek (SB), The Cove (Cove Creek), Bass Creek, and Parrot Point Creek. There are a total of 66.2 square miles of estuarine areas in this watershed.

Water Quality

Station #	Type	Class	Description
MD-026	P	SFH	STONO RIVER AT SC 700
MD-034	P	SA	RT BK OF ASHLEY R. BTWN MOUTH OF JAMES IS. CK & DILL CK
MD-165	P	SB	CHARLESTON HARBOR AT FT JOHNSON PIER AT MARINE SCI LAB
MD-048	P	SB	S.CHANNEL CHAS HARBOR OFF FT JOHNSON STA BELL BUOY 28

MD-247	P	SB	CHARLESTON HARBOR NEAR MT. PLEASANT WWTP DIFFUSER
MD-071	P	SB	SHEM CREEK AT BRIDGE ON US 17
MD-206	S	SFH	STONO RIVER AT ABBAPOOLA CREEK
MD-207	S	SFH	KIAWAH RIVER MOUTH AT STONO RIVER
MD-208	S	SFH	STONO RIVER MOUTH AT BUOY 10 OFF SANDY POINT

Charleston Harbor - The Charleston Harbor is located at the confluence of the Ashley (03050202-040), Cooper (03050201-050), and Wando (03050201-080) Rivers. The surface area of the harbor is 65 km^2 with an additional 104 km^2 of marsh and lowlands. The harbor drains an area of 42,000 km^2, and has a mean tidal range of 1.6m with an average depth of low water of 3.7m. The Ashley and Wando Rivers exhibit little freshwater input; however, the Cooper River is fed by freshwater from Lake Moultrie through the Pinopolis Dam with average daily flows ranging from 0.0 cfs to 20,240 cfs.

There are three monitoring sites in the Charleston Harbor. Near the Mount Pleasant wastewater treatment plant discharger **(MD-247)**, aquatic life uses are fully supported; however there was a very high concentration of zinc measured in 1996 and a very high concentration of nickel measured in 1998. A significant decreasing trend in total nitrogen concentrations suggests improving conditions for this parameter. Recreational uses are fully supported.

At the Fort Johnson pier **(MD-165)**, aquatic life uses are fully supported; however there is a significant increasing trend in turbidity. A significant decreasing trend in total nitrogen concentrations suggests improving conditions for this parameter. Recreational uses are fully supported; however there is a significant increasing trend in fecal coliform concentrations.

Off the Fort Johnson quarantine station **(MD-048)**, aquatic life uses are fully supported; however there is a significant increasing trend in total suspended solids and diethyl phthalate was detected in 1994. In sediments, di-n-butylphthalate was detected in the 1995 sample. Also in sediments, mercury exceeded the Effects Range Low (ERL) concentration, but was less than Effects Range Median (ERM) concentration. Recreational uses are fully supported.

Ashley River (MD-034) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant decreasing trend in total nitrogen concentrations suggests improving conditions for this parameter. Recreational uses are fully supported.

Shem Creek (MD-071) - Aquatic life uses are partially supported due to dissolved oxygen excursions, compounded by a significant decreasing trend in dissolved oxygen concentrations. A significant decreasing trend in total nitrogen concentrations suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Kiawah River (MD-207) - Aquatic life uses are fully supported; however there is a significant increasing trend in turbidity. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are fully supported.

Stono River - Water quality at this site is influenced by water entering from Charleston Harbor on the rising tide. There are three monitoring sites along this section of the Stono River and recreational uses are fully supported at all sites. At the upstream site ***(MD-026)***, aquatic life uses are partially supported due to dissolved oxygen excursions. In addition, there was a significant decreasing trend in dissolved oxygen concentrations and a significant increasing trend in turbidity. There is also a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentrations suggest improving conditions for these parameters. In sediments, a high concentration of zinc was measured in 1994, and high concentrations of chromium and lead were measured in 1996. Sediment lead concentrations in 1995, 1996, and 1997 all exceeded the Effects Range Low concentration (ERL), but were less than Effects Range Median (ERM) concentration.

Further downstream ***(MD-206)***, aquatic life uses are not supported due to dissolved oxygen excursions, compounded by a significant increasing trend in turbidity. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. At the furthest downstream site ***(MD-208)***, aquatic life uses are fully supported; however there is a significant increasing trend in turbidity.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)*** ***COMMENT***	***NPDES#*** ***TYPE*** ***LIMITATION***
CHARLESTON HARBOR MT PLEASANT WTP #1 PIPE #: 001 FLOW: M/R	SC0043265 MINOR DOMESTIC EFFLUENT
CHARLESTON HARBOR MT PLEASANT WTP #3 PIPE #: 001 FLOW: M/R	SC0043869 MINOR DOMESTIC EFFLUENT
CHARLESTON HARBOR MT PLEASANT/CENTER ST. PIPE #: 001 FLOW: 6.7 PIPE #: 002,003 FLOW: M/R	SC0040771 MAJOR DOMESTIC EFFLUENT
CHARLESTON HARBOR CHARLESTON CPW/PLUM ISLAND PIPE #: 001 FLOW: 27.0	SC0021229 MAJOR DOMESTIC EFFLUENT
CHARLESTON HARBOR FORT SUMTER NATL. MONUMENT PIPE #: 001 FLOW: M/R	SC0047147 MINOR INDUSTRIAL EFFLUENT
COVE CREEK TOWN OF SULLIVANS ISLAND WWTP PIPE #: 001 FLOW: 0.57	SC0020052 MINOR DOMESTIC EFFLUENT

FOLLY CREEK TRIBUTARY	SCG130001
ATLANTIC LITTLENECK CLAM FARM	MINOR INDUSTRIAL
PIPE #: 001,002,003 FLOW: M/R	WQL FOR BOD_5, NH3-N, DO, FC
(PERMIT INACTIVATED)	

Nonpoint Source Management Program

Camping Facilities

FACILITY NAME/TYPE	***PERMIT #***
RECEIVING STREAM	***STATUS***
ST CHRISTOPHER CAMP/RESIDENT	10-305-0009
KIAWAH RIVER	ACTIVE

Mining Activities

MINING COMPANY	***PERMIT #***
MINE NAME	***MINERAL***
CHARLESTON COUNTY	0314-19
KINSEY-BLAKE BORROW PIT	SAND/CLAY
DIRTCO	0512-19
MURRAY WOODS PIT	SAND/CLAY
ISLAND CONSTRUCTION CO.,INC.	0660-19
TREMONT MINE	SAND
LOWCOUNTRY DIRT, INC.	1005-19
BATTERY ISLAND MINE	SAND
TRULUCK CONSTRUCTION CO.	0687-19
EXCHANGE LANDING MINE	SAND
THREE OAKS LANDSCAPE NURSERY, INC.	0788-19
BURNIN ACRES MINE	SAND
THREE OAKS CONTRACTORS, INC.	1129-19
CHICKEN FARM MINE	SAND

Land Disposal Activities

Land Application Sites

LAND APPLICATION SYSTEM	***PERMIT #***
FACILITY NAME	***TYPE***
SPRAY ON GOLF COURSE	ND0017361
KIAWAH ISLAND	DOMESTIC

Landfill Facilities

SOLID WASTE LANDFILL NAME	***PERMIT #***
FACILITY TYPE	***STATUS***
TOWN OF SULLIVANS ISLAND	-------
MUNICIPAL	CLOSED

Growth Potential

There is a high potential for growth in this watershed. Suburban growth areas include: the Dills Property, Ellis Property II, Stiles Point Plantation, Stonefield, Fort Lamar, Grimbel Shores, and Harborwoods III on James Island; and Kiawah Island, Andell Property, and Hope Plantation on Johns Island. All growth areas in the watershed have water and sewer services available.

Watershed Protection and Restoration

Special Projects

Charleston Harbor Project

For the past five years, the Charleston Harbor Project has been conducting hundreds of experiments and studies in an effort to come up with a Special Area Management Plan for the Charleston Harbor. The primary goals of the Harbor Project are simple: to maintain and enhance the quality of the environment in the Charleston Harbor estuary system, to maintain the wide range of water uses and natural resources of the systems; and to anticipate and address potential problems before adverse impacts occur. The reason to address these issues now is clear: If you do not take steps to save the harbor, it will cost a lot more in the future. For example, Boston Harbor is now in an 11-year cleanup program. The cleanup program is estimated to cost between $3.5 and $4 billion. Tampa Bay has been trying to clean up its harbor after years of neglect. So far, it has run up a price tag of $2.5 billion. Continuing expenditures are estimated at more than $200 million per year. In 1999, the Charleston Harbor Project will submit a final report on what needs to be done to protect the Charleston Harbor.

The Charleston Harbor Models

Two different models have been developed for wasteload allocations purposes for the Charleston Harbor system. The initial model was developed through the Charleston Harbor Project (CHP) and the second model was developed by Applied Technologies and Management (ATM) for the Cooper River Water Users Association. Working in conjunction with the Department, the University of South Carolina, Clemson University, and the United States Geological Survey (USGS), CHP s goal was to develop a tool for the Department's use in point source wasteload allocation and Total Maximum Daily Load (TMDL) determination. The modeled domain, for both models, encompasses the Cooper River and its major tributaries from Pinopolis Dam to its confluence with the Wando River, the Wando River from its headwaters to the confluence with the Cooper River, and the Ashley River from Bacon Bridge downstream to the U.S. Hwy. 17 Bridge. Hydrodynamics, for CHP s effort, are modeled using the one-dimensional BRANCH model while water quality is modeled using the one-dimensional Branched Lagrangian Transport Model. Modeling data were collected in May and August of 1993 by the Department and the USGS. Hydrodynamics, for ATM s effort, are modeled using the two-dimensional boundary fitted circulation model. Water quality is modeled using the two dimensional WQMAP which

uses EPA WASP5 eutrophication model kinetics. Modeling data were collected in September 1996 by ATM and August of 1993 by the Department and the USGS. The Department plans on using the two models in concert to determine TMDL and point source wasteload allocations for the Charleston Harbor system.